

REMARKS

Claims 1-9, 12, 14-36, 38-53, 56, 58-89, 91, 92, 94, 95, 97, 98, 100-108, 111-113, 115-133 and 136-162 are pending. Claims 10, 11, 13, 37, 54, 55, 57, 90, 93, 96, 99, 109, 110, 114, 134 and 135 have been cancelled.

Claims 1-5, 89, 92, 101 and 126 stand rejected under 35 U.S.C. § 103(a) as being anticipated by EP 0849685 to Vogley in view of U.S. Patent No. 6,529,534 to Yasuda. Applicants respectfully request reconsideration of this rejection.

Claim 1 recites a “memory system” including “a memory controller” and at least one “memory storage device.” The memory system includes “a continuous optical path coupled to said memory controller and to said memory bus” and “a wavelength-adjustable electro-optical converter.” The optical path comprises “a first *wavelength-adjustable* electro-optical converter arranged and configured for exchanging data between said controller and said at least one memory storage device.”

The Office Action admits that Vogley fails to disclose “a wavelength-adjustable electro-optical converter.” The Office Action relies on Yasuda as disclosing a wavelength adjustable optical transmitter, but there is no motivation to combine Yasuda with Vogley.

The Office Action states that replacing the non-adjustable optical transmitter of Vogley with the wavelength adjustable transmitter of Yasuda “eliminates the problem of drift,” but there is no indication in Vogley, Yasuda, or anywhere else, that drift would be a problematic issue with the transmitter of Vogley. In fact, Yasuda states that drift is generally introduced through “secular degradation of the laser diode or the temperature sensor,” none of which are present or contemplated by Vogley. Accordingly, one of ordinary skill would not have looked to Yasuda or elsewhere, because secular degradation of the laser diode or the temperature sensor was not an issue in the Vogley sensor. The Office Action has not applied the proper test for obviousness; accordingly, the Office Action fails to make a *prima facie* case of obviousness.

Applicants respectfully submit that there is no motivation to combine the cited references to obtain the invention of claim 1. Motivation or suggestion to combine or modify

prior art references “must be clear and particular, and it must be supported by actual evidence.” *Teleflex, Inc. v. Ficosa North America Corp.*, 299 F.3d 1313, 1334 (Fed. Cir. 2002). Because the “genius of invention is often a combination of known elements which in hindsight seems preordained,” the Federal Circuit requires a “rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references.” *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351 (Fed. Cir. 2001). Yet there is no teaching or suggestion within any of the references that provide a motivation to combine them.

Courts have generally recognized that a showing of a *prima facie* case of obviousness necessitates three requirements: (i) some suggestion or motivation, either in the references themselves or in the knowledge of a person of ordinary skill in the art, to modify the reference or combine the reference teachings; (ii) a reasonable expectation of success; and (iii) the prior art references must teach or suggest all claim limitations. *See e.g., In re Dembiczak*, 175 F.3d 994 (Fed. Cir. 1999); *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998); *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996); and MPEP §§ 706.02(j) and 2143 *et seq.* Furthermore, the “[t]he teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).” MPEP §706.02(j).

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990). Thus, a showing of an obvious combination requires more than just an amalgam of references, each of which provides one feature of the claimed invention.

The Office Action has done no more than cite a pair of references, each of which allegedly provides only part of the claimed invention, and allege that their combination renders the invention obvious. However, without the benefit of hindsight, there would have been no motivation to combine these references and the Office Action has failed to provide proof of any such motivation.

Since there is no motivation to combine the teachings of Vogley and Yasuda, claim 1 is not obvious over the cited references. Applicants respectfully request that the 35 U.S.C. § 103(a) rejection of claim 1 and dependent claims 2-5 be withdrawn and the claims allowed.

Claim 89 recites an electro-optical converter for a memory system that includes “at least one input for receiving an electrical data signal from a memory controller,” and “at least one *wavelength-adjustable* device arranged and configured to convert said data signal to an optical signal.” At least one optical output is “arranged and configured to transmit said optical signal into an optical path coupled to a memory storage device.” As discussed above with respect to claim 1, there is no motivation to combine Yasuda with Vogley or any other cited. Claim 89 is patentable over Vogley, Yasuda and Acton et al., alone or in combination.

Claim 92 recites an electro-optical converter for a memory system that includes “at least one input arranged and configured to receive an electrical data signal from at least one memory storage device,” and “at least one *wavelength-adjustable* device arranged and configured to convert said data signal to an optical signal.” The memory system also includes “at least one optical output arranged and configured to transmit said optical signal into an optical path.” As discussed above with respect to claim 1, there is no motivation to combine Yasuda with Vogley or any other cited reference. Claim 92 is patentable over Vogley and Yasuda, alone or in combination.

Claim 101 recites a method of operating a memory system comprising “receiving an electrical signal output from a memory controller” and “converting said electrical signal output from said controller to an optical signal for transmission on said optical path, said conversion step further comprising *adjusting the wavelength* of said optical path.” The method also includes “transmitting said optical signal over an optical path to a memory storage device.” As discussed above with respect to claim 1, there is no motivation to combine Yasuda with Vogley or any other cited reference. Claim 101 is patentable over Vogley and Yasuda, alone or in combination.

Claim 126 recites a method of operating a memory system comprising “receiving an electrical signal output from at least one memory storage device; converting said electrical signal

output from said memory storage device to an optical signal for transmission on said optical path, said conversion step further comprising *adjusting the wavelength* of said optical path” and “transmitting said optical signal over an optical path to a memory controller controlling said at least one memory storage device.” As discussed above with respect to claim 1, there is no motivation to combine Yasuda with Vogley or any other cited reference. Claim 126 is patentable over Vogley and Yasuda, alone or in combination.

Accordingly, Applicant respectfully requests that the above rejection of claims 1-5, 89, 92, 101 and 126 be withdrawn and the claims allowed.

Claims 6-8, 12, 14, 24-36, 38-41, 44-51, 53, 56, 58, 68-71, 73-85, 88, 91, 94, 95, 97, 98, 100, 102-107, 115-123, 127-132, 139-148, 150, 151, 155 and 159 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Vogley in view of Yasuda, and further in view of U.S. Pat. No. 5,544,319 to Acton et al. (Acton). Applicants respectfully request reconsideration of this rejection.

Claims 6-8, 10, 12, 14, 24-36, 38-41, 44 and 151 depend from claim 1. The deficiencies of Vogley and Yasuda with respect to claim 1 have been discussed above. Acton et al. discloses an optical link between two memory coupling system controllers, and does not cure these deficiencies or provide any motivation to combine Yasuda with Vogley. As such, claims 6-8, 10, 12, 14, 24-36, 38-41 44, and 151 are allowable over the cited combination.

Claim 45 recites a computer system including, *inter alia*, a memory system connected to a processor. The memory system includes “a memory controller” and “at least one memory storage device.” The memory system also includes an “optical path coupling said memory controller with said at least one memory storage device for optically exchanging data between said controller and said at least one memory storage device” and “a *wavelength-adjustable* electro-optical converter.”

Neither Vogley nor Acton disclose “a wavelength-adjustable electro-optical converter.” As demonstrated above, there is no motivation to combine Yasuda with Vogley or Acton. Claim 45 and its dependent claims (i.e. claims 46-51, 53, 56, 58, 68-71, 73-85, 88 and 155) are patentable over Vogley, Yasuda and Acton et al., alone or in combination.

Claim 91 depends from claim 89. The deficiencies of Vogley and Yasuda with respect to claim 89 have been discussed above. Acton et al. discloses an optical link between two memory coupling system controllers, and does not cure these deficiencies or provide any motivation to combine Yasuda with Vogley. As such, claim 91 is allowable over the cited combination.

Claim 95 recites an electro-optical converter for a memory system comprising "at least one input arranged and configured to receive an optical data signal from an optical path coupled to a memory storage device." At least "one wavelength-adjustable electro-optical converter is arranged and configured to convert said received data signal to an electrical signal." At least "one electrical output is arranged and configured to transmit said output signal to an electrical path of a memory controller."

Neither Vogley nor Acton disclose "a wavelength-adjustable electro-optical converter." As demonstrated above, there is no motivation to combine Yasuda with Vogley or Acton. Claim 95 and its dependent claims (i.e. claim 97) are patentable over Vogley, Yasuda and Acton et al., alone or in combination.

Claim 98 recites an electro-optical converter for a memory system comprising "at least one input arranged and configured to receive an optical data signal from an optical path," and "at least one wavelength-adjustable electro-optical converter arranged and configured to convert said received optical data signal received by said at least one input to an electrical signal." The memory system also includes at least "one electrical output arranged and configured for transmitting said output electrical signal to an electrical path of a memory storage device."

Neither Vogley nor Acton disclose "a wavelength-adjustable electro-optical converter." As demonstrated above, there is no motivation to combine Yasuda with Vogley or Acton. Claim 98 and its dependent claims (i.e. claim 100) are patentable over Vogley, Yasuda and Acton et al., alone or in combination.

Claims 102-107, 115-123 and 159 depend from claim 101. The deficiencies of Vogley and Yasuda with respect to claim 101 have been discussed above. Acton et al. discloses an optical link between two memory coupling system controllers, and does not cure these deficiencies or provide any motivation to combine Yasuda with Vogley. As such, claims 102-107, 115-123 and 159 are allowable over the cited combination.

Claims 127-132, 139-148 and 150 depend from claim 126. The deficiencies of Vogley and Yasuda with respect to claim 126 have been discussed above. Acton et al. discloses an optical link between two memory coupling system controllers, and does not cure these deficiencies or provide any motivation to combine Yasuda with Vogley. As such, claims 127-132, 139-148 and 150 are allowable over the cited combination.

In addition, the Office Action asserts that it would have been obvious to combine the teachings of Acton with Vogley and Yasuda to arrive at the claimed invention "to control the information between the memory controller and the memory storage device." However, Acton does not contain such a teaching (and the Office Action does not teach the control of such information over a continuous optical path or using a wavelength adjustable transmission system.

Even if this citation to Acton were evidence of a motivation to combine, the purported motivation applies only to claims 6, 105 and 130, which contain limitations regarding command data. For every other rejected dependent claim, e.g. 7, 8, 12-14, 24-36, 38-41, 44-51, 53, 56, 58, 68-71, 73-85, 88, 91, 94, 95, 97, 98, 100, 102-104, 106, 107, 115-123, 127-129, 131, 132, 139-148, 150, 151, 155 and 159, the Office Action cites no motivation whatsoever.

The Office Action asserts that Acton discloses the missing features from these dependent claims (see, e.g., p. 5-9), but the only assertion of motivation to combine these features with the combination of Vogley and Yasuda (which has already been shown to be itself improper) is the assertion that Acton contains a teaching "to control the information between the memory controller and the memory storage device." This, at best, applies to claims 6, 105 and 130 only. For example, even if true, this would not show any motivation to combine a clock signal (claims 7, 32, 36, 80, 81, 106 and 131), data that includes at least one read and write data

(claims 29, 73, 76, 103 and 128), address data (claims 31, 35, 75, 79, 104, 120, 129 and 145), a memory coupled system (claims 24, 25, 68, 69, 115, 139 and 140), or the integration of a controller, memory device, optical path and/or processor on a single die (claims 39, 40, 83, 84, 121, 122, 146 and 147) with the combined teachings of Vogley and Yasuda.

Accordingly, for these reasons as well, there is no motivation to combine the teachings of Acton with the combined teachings of Vogley and Yasuda. For at least the above reasons, the rejection of claims 6-8, 12, 14, 24-36, 38-41, 44-51, 53, 56, 58, 68-71, 73-85, 88, 91, 94, 95, 97, 98, 100, 102-107, 115-123, 127-132, 139-148, 150, 151, 155 and 159 should be withdrawn and the claims allowed.

Claims 9, 15-23, 42, 43, 52, 59-67, 86, 87, 108, 111-113, 124, 125, 133, 136-138, 149, 152-154, 156-158, and 160-162 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Vogley in view of Yasuda, further in view of Acton et al. and further in view of U.S. Pat. No. 6,658,210 to Fee. Applicants respectfully request reconsideration of this rejection.

Claims 9, 15-23, 42, 43, and 151-154 depend from 1. Claim 1 is patentable over Vogley in view of Yasuda and Acton et al. Fee has not been cited against claim 1, and in any event would not combine with Vogley in view of Yasuda and Acton et al. to establish *prima facie* obviousness. Claim 1 and its dependent claims are patentable over the combination of cited references to Vogley, Yasuda, Acton et al. and Fee.

Claims 52, 59-67, 86, 87, and 156-158 depend from claim 45. Claim 45 is patentable over Vogley, in view of Yasuda and further in view of Acton et al. Fee has not been cited against claim 45, and in any event would not combine with Vogley in view of Yasuda and Acton et al. to establish *prima facie* obviousness. Claim 45 and its dependent claims are patentable over the combination of cited references to Vogley, Yasuda, Acton et al. and Fee.

Claims 108, 111-113, 124, 125, and 160-162 depend from claim 101. Claim 101 is patentable over Vogley, in view of Yasuda and further in view of Acton et al. Fee has not been cited against claim 101. Even if Fee had been properly cited against claim 101, the proposed

combination with Acton et al. would not establish *prima facie* obviousness. Claim 101 and its dependent claims are patentable over the proposed combination of Vogley, Yasuda, Acton et al. and Fee.

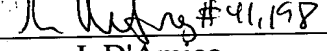
Claims 133, 136-138, and 149 depend from claim 126. Claim 126 is patentable over Vogley, in view of Yasuda and further in view of Acton et al. Fee has not been cited against claim 126, and even if properly cited would not combine with Acton et al. to render claim 126 *prima facie* obvious. Claim 126 and its dependent claims 127-150 are patentable over the proposed combination of Vogley, Yasuda, Acton et al. and Fee.

Accordingly, the Office Action again does not demonstrate motivation to combine Fee with the combined teachings of Vogley, Yasuda, and Acton (a total of *four* different references) to arrive at the patented invention. Applicant respectfully requests that the rejection of claims 9, 15-23, 42, 43, 52, 59-67, 86, 87, 108, 111-113, 124, 125, 133, 136-138, 149, 152-154, 156-158, and 160-162 be withdrawn and the claims allowed.

In view of the above, applicant believes the pending application is in condition for allowance.

Dated: September 19, 2006

Respectfully submitted,

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